Before the

FEDERAL COMMUNICATIONS COMMISSION

Washington, D.C.

In the Matter of	)	
	)	
Redevelopment of the Spectrum to	)	ET Docket No. 92-9
Encourage Innovation in the	)	
Use of New Telecommunications	)	RM-7981
Technologies	)	RM-8004

COMMENTS OF
GE AMERICAN COMMUNICATIONS, INC.

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Table of Contents

Summary

In these comments, GE American Communications, Inc. ("GE Americom") opposes the proposal in the Further Notice of Proposed Rulemaking in these proceedings to rechannel terrestrial frequencies in the 4 GHz band, the band in which GE Americom's C-band customers downlink video and audio programming to thousands of cable head-ends and several million backyard dish users. If adopted, the rechannelization proposal would reduce the guardbands between microwave and satellite frequencies. In so doing, rechannelization of the C-band frequencies would adversely affect the operation of well over a dozen C-band satellites now in orbit and their successors, which are now being constructed and launched, thereby jeopardizing the billions of dollars satellite operators and customers have invested in these satellites to bring high-quality reception of video and other programming, via tens of thousands of licensed antennas, to over 50 million households. It will also impair the operations of additional millions of unlicensed backyard C-band antennas being used to deliver video signals to homes in remote locations not passed by cable.

In addition to the investments made in C-band satellites themselves, thousands of licensees have already spent millions of dollars in coordinating C-band antennas under the present regulatory framework in the expectation that these investments would be protected, and these antennas are providing important services to millions of viewers. It would be manifestly unfair for the Commission to depart from its historic policies, which properly place responsibility for coordination on the latter-built facilities, and require satellite antennas already licensed under Part 25 to undergo coordination a second time.

But even if the Commission were to grant existing C-band earth stations protection against degradation of signal quality due to interference from microwave operations on the frequencies the rechannelization plan would permit, the resulting situation would continue to be contrary to the public interest, because it would inflict substantial adverse consequences upon other important segments of the satellite market. Even under such protection, rechannelization would still substantially burden and restrict the licensing of new C-band satellite antennas required to serve the continuing growth in video and audio services to the consuming public and would continue to inflict substantial interference on existing unlicensed backyard C-band dishes.

New C-band satellites that the Commission authorized several years ago are just now being launched and being placed into service, and there are additional programming services that will use these satellites to serve cable and individual viewers. Both of these developments in the use of C-band antennas by satellite-based services will, in the strong public interest of widening

the choice of video programming to viewers, require continued expansion in the use of the C-band frequencies. However, if the Commission adopts the proposed plan, it will substantially impair or could even prevent that growth, contrary to the public interest.

In addition, protecting existing licensed C-band antennas from the adverse effects of the proposed rechannelization plan would not ameliorate the interference inflicted on backyard antennas and would certainly stifle growth in the use of those of antennas. As the Commission knows, backyard antennas deliver programming to millions of homes in remote areas. The degradation in signal quality represented by the proposed rechannelization of C-band frequencies threatens the investment that consumers have already made in existing backyard antennas.

Adoption of the rechannelization plan would be premature as well as unwise. It is not certain what degree of offset between satellite frequencies and those used by terrestrial services is necessary to protect digitized and compressed television from degradation. The Commission should not adopt any rechannelization proposals without considering the nature of the degradation effects of terrestrial microwave into digital compressed video carriers, the technology necessary to mitigate this interference, and the responsibility for developing and installing this technology.

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COMMENTS OF
GE AMERICAN COMMUNICATIONS, INC.

GE American Communications, Inc. ("GE Americom") hereby comments on the Further Notice of Proposed Rule Making in the above-referenced docket,[1] which proposes to reallocate bands above 3 GHz to private and common carrier fixed microwave licensees and to prescribe regulations governing the use of these frequencies.

Introduction

GE Americom is a pioneer in the domestic communications satellite industry, having launched its first satellite nearly two decades ago. It currently operates a fleet of five C-band and two Ku-band satellites and is in the process of ensuring continued capacity into the second decade of the 21st century by constructing a C/Ku-band hybrid satellite.

The 4 GHz band is used as the downlinking avenue for C-band satellite-delivered video and other critical services. The importance of these services to the consuming public dictates

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[1] Order FCC 93-357 (released Sept. 3, 1992)("Further Notice").

that they continue without harmful interference.

One of the principal reasons that satellite and terrestrial operations can satisfactorily share the 4 GHz band is that the current channelization plan ensures that there are adequate offsets between the frequencies of the two separate services. The Further Notice's rechannelization proposals will reduce the frequency offsets, however, so as to make sharing virtually impossible. While GE Americom appreciates the Commission's need to make allocations for 2 GHz terrestrial users that may be displaced by new technologies, its overriding concern is that migration of these terrestrial transmitters to the 4 Ghz band under the proposed rechannelization plan will inflict intolerable interference on the users of C-band satellite technology, including GE Americom's customers. In the aggregate, these users and their satellite- service suppliers have invested billions of dollars in high-technology C-band satellites, antennas and other ground equipment in the expectation that they could use these facilities into the 21st century to provide high quality and important services to the public. From this perspective alone, the rechannelization plan is contrary to the public interest and should not be adopted.

In addition, the impact of the rechannelization proposal upon home antenna users would be similarly intolerable, since the proposal, if adopted, would jeopardize the investments they have made as consumers in the reasonable expectation that the

Commission would not cause the utility they derive from their antennas and associated electronic equipment to be eroded.

Even if the Commission were to protect existing licensed earth stations against degradation in signal quality caused by interference from microwave operations on the new frequencies, the proposed rechannelization of the 4 GHz band would remain contrary to the public interest. The present proposal will thwart the expansion of the C-band ground segment, since licensing new antennas with signal quality comparable to that which exists today will be virtually impossible. Moreover, a grant of protection against degradation to existing licensed antennas will not relieve the interference which would be suffered by the millions of consumers who have invested in backyard antennas and electronic equipment used with them. Thus, protection of existing earth stations from degradation is only a partial solution, and one that ignores the need for continued growth in C-band use as well as the need to avoid harmful interference to consumers who use backyard dishes. These segments of the C-band satellite industry are entitled to protection from interference.

Finally, the Commission should not adopt rules without determining their impact upon the transition of present analog video services to digital and compressed ones, including Advanced Television, the technology necessary to prevent interference, and the responsibility for development and installation of this technology.

I.

ADOPTION OF THE RECHANNELIZATION PROPOSAL WILL JEOPARDIZE MILLIONS OF DOLLARS IN INVESTMENT IN C-BAND SATELLITES AND ANTENNAS

A. The Present Channelization Plan Has Been Relied Upon by Satellite Operators, Satellite Customers, and End-Users of Satellite Services to Protect High-Quality Reception of Satellite Signals

To a large degree, the customers of GE Americom and other C-band satellite service providers have been successful in avoiding interference in downlink antennas from terrestrial service because of the nature of the current channel plan for sharing the C-band spectrum between C-band downlink users and fixed microwave services. Under the current plan, the downlink frequencies of the centers of C-band satellite transponders are spaced at 20 MHz intervals beginning at 3720 Mhz (e.g., 3720 MHz, 3740 MHz, etc.), while the channels of point-to-point microwave services in this band are spaced at 20 MHz intervals beginning at 3710 MHz (e.g., 3730 MHz, 3750 MHz, etc.) This results in terrestrial microwave transmissions with most of their energy concentrated within a 2 MHz bandwidth at ± 10 MHz from the center of a C-band transponder. This energy can be rejected from the television channel by use of an intermediate frequency notch filter. The use of notch filtering is one of the mechanisms by which terrestrial interference is eliminated or reduced to tolerable levels. Another mechanism is to shield an antenna to make use of natural geographic features, such as hills, or man-made structures, such as buildings. These measures against

protection, assisted by the frequency coordination process, keep co-frequency interference to a minimum and allow satellite users and point-to-point services to operate their respective systems satisfactorily.

The historic demand for C-band satellite services has resulted in tens of thousands of embedded television receive-only antennas licensed under Part 25. All of these antennas have been fully coordinated to be accommodated within the existing 4 GHz channelization plan. Licensees of these antenna systems have spent millions of dollars in site selection and acquisition, engineering studies, physical modifications, and regulatory efforts in order to effect proper coordination with microwave operations, and these licensees have invested those sums in the expectation that they had taken all steps necessary to be protected against present and future microwave interference. All of these antennas are actively involved in providing valuable services to the public.

Satellite operators and their customers have also relied upon the present channel plan to ensure the continued ability of C-band satellites to deliver high-quality signals and have relied upon protection against microwave interference by investing billions of dollars in high-technology C-band satellites that are planned to provide video and other programming to over fifty million end users into the 21st century. For many satellite customers, creating and distributing video programming is their

only business, and there are no present substitutes for satellites for nationwide delivery of this programming to end users.

Given these significant investments, and the reliance of satellite operators, their customers, earth-station licensees and end-users upon the legitimate expectation that earth stations would continue to receive high quality signals into the future, the Commission should not disrupt the present channelization plan in the 4 GHz band.

B. The Proposal of the Further Notice to Rechannel the 4 GHz Band Would Adversely Impact the Continuation of High-Quality Satellite Services

Although a typical video signal is 30 MHz in bandwidth, most of the energy of such a signal is concentrated in the center frequencies of a transponder, in a band of 12 MHz or smaller. As a result of the use at the receiving earth station of the notch filters described above, it is possible to block out interference from terrestrial services without distortion of the desired television signal. However, the new channelization plan proposed in the Further Notice would permit terrestrial carriers to be located closer than the present ± 10 MHz to the center frequency of the desired television signals. For example, proposed section 21.701(d)(1) would permit 100 kHz bandwidth microwave channels to transmit at 3719.7825 MHz -- or at an offset of 0.2175 MHz -- from 3720 MHz, which is the center frequency of the first C-band satellite transponder. This would result in a situation where

the interfering terrestrial channel would be virtually at co-frequency with the center frequency of the satellite transponder. In such a case, the use of a notch filter would reject a significant portion of the energy of the desired television channel and greatly distort the television signal.

An offset of greater than ± 10 MHz is equally harmful. For example, while a ± 15 MHz offset would move a terrestrial signal away from the center of one transponder, it would at the same time move the undesired signal 5 MHz closer to the center frequency of the next satellite transponder, increasing the risk of co-frequency interference to the second transponder.

The reduced separations between satellite and microwave frequencies inherent in the proposed rechannelization plan would affect all twenty-four transponders used on modern operational C-band satellites. Satellites lack the flexibility to avoid the interference that will result from the reduced frequency offsets set forth in the proposed rechannelization plan. Because the de facto standard bandwidth of existing and planned C-band transponders is 36 MHz, there is little flexibility for a customer uplinking a standard analog video signal (bandwidth in the 30 MHz to 36 MHz range) to shift that signal away from the center frequency of the transponder to avoid harmful and unavoidable interference caused by the proposed rechannelization plan.

The proposal is truly a blueprint for disaster. No

matter how much good faith coordination is expended on the part of all parties, it will not be sufficient. The interference caused by the reduced offsets will severely limit the ability of those customers who use satellites to deliver acceptable programming to C-band receive-only antennas. Depending on the energy of the interfering source, even high-technology antennas that comply with the Commission's two-degree satellite spacing policy, in which licensees have invested millions of dollars, would suffer excessive and harmful interference if the interfering signal of a nearby microwave facility were offset less than ± 10 MHz. Obviously, this is an unacceptable result and is contrary to the strong public interest in assuring high quality reception of television signals.

GE Americom's apprehension that the new frequencies proposed under the rechannelization plan will severely impact the earth station market is hardly an idle one. Allowing increased terrestrial use of the 4 GHz band proposed in the Further Notice reflects the Commission's expectation that the 4 GHz band will be the logical first choice for most of the fixed users that can no longer be accommodated in the 2 GHz band. More than a decade ago, the Commission characterized the 4 GHz band as becoming increasingly intensively used.[2] The Further Notice would encourage additional crowding in the limited spectrum already existing in this band by authorizing an expanded class of fixed

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[2] Microwave Radio Relay Systems, 88 FCC 2d 135, 137 (1981).

microwave users into the 3.7-4.2 Ghz band. The Further Notice would not only increase the number of Part 21 operations that are currently authorized to utilize the band, but it would also open the band to even greater numbers of Part 94 licensees using the band for the first time.[3]

The extent of migration, and the consequent channel crowding, is likely to be substantial. For example, the Commission's Office of Engineering and Technology estimates that nearly 30,000 Part 21 and Part 94 users now located in the 2 GHz band may be subject to relocation.[4] Because of the realistic prospects of increased crowding, the frequency coordination necessary to protect new satellite antennas from harmful interference will become more complex, time-consuming and difficult than it is today, even if the Commission retains the ± 10 MHz separation between satellite and terrestrial services. Elimination of the ± 10 MHz separation will make coordination of new C-band satellite antennas virtually impossible.

For these reasons, GE Americom believes that the proposed rechannelization plan unfairly undermines the interests of satellite earth stations against those of fixed terrestrial

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[3] The proposed rules do not limit migration to the 4 GHz band merely to terrestrial services no longer able to use the 2 GHz band but open the new band to Part 94 users that might be interested in its superior operational characteristics.

[4] Creating New Technology Bands for Emerging Telecommunications Technology, OET/TS 92-1 (1992) at 19.

services and that such a one-sided proposal should not be adopted.

II.

THE ADVERSE IMPACT OF THE PROPOSED RECHANNELIZATION WILL BE WIDESPREAD EVEN IF THE COMMISSION PROTECTS EXISTING LICENSEES FROM INTERFERENCE

A. If The Commission Were to Adopt the Proposed Rechannelization, The Public Interest Would Require that it Protect Existing Earth Stations from Degradation of Signal Quality Resulting from Interference by Microwave Services Operating on the New Frequencies

GE Americom believes that, at a minimum, the Commission must confirm that existing licensed earth stations will be allowed, without undergoing coordination again, to continue their operations without harmful interference caused by fixed terrestrial use of the reduced frequency offsets involved in the proposed rechannelization plan.

In the interest of regulatory certainty and simple fairness, as well as the preservation of existing services, if the Commission adopts the rechannelization plan, GE Americom believes that it must also respect the expectation on the part of satellite customers and end-users that their existing Facilities, in which they have invested billions of dollars, will not be degraded. Rather than changing the rules of the game, the Commission would in fairness be required to protect existing earth stations by refusing to make the continuation of operations subject to recoordination with terrestrial services operating on new frequencies.

To protect existing earth stations against interference from microwave transmitters operating on new frequencies would be fully consistent with the Commission's frequency coordination policies, which properly place responsibility for coordination exclusively upon the proposed licensee of the later-built facility. Part 21.100(d)(1) of the Commission's regulations, which applies to the coordination of satellite as well as to terrestrial services, makes clear that there is no obligation on the licensee of any existing facility to re-engineer that facility to accommodate conflicting operations.[5] As the Commission previously summarized its policies in this area:

> The obligations and constraints placed on applicants entitled to share spectrum where there is a potential for interference are outlined in the rules and generally are determined by the filing order of the applicants. The initial applicant intending to use spectrum in an area, generally, can plan the use of the spectrum limited only by prevailing rules and policies. Subsequent applicants entitled to use the spectrum, however, must plan their service in a manner that will not unreasonably burden the initial applicant.[6]

GE Americom has always cooperated in good faith in coordinating satellite downlink operations with terrestrial services and believes the coordination obligations that the Commission has established are fair and proper. GE Americom also believes that a change in those policies in the present circumstances would be essentially misguided and unfair. Any

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[5] See also 47 C.F.R. § 21.101(e), which provides that, in the event of co-pending applications, "it shall be the obligation of the later filing applicant to amend his application to remove the [frequency] conflict * * *."

[6] Microwave Radio Relay Systems, supra, 88 FCC 2d at 140.

policy that would require it, its customers, or C-band antenna licensees to undergo the cost of re-engineering existing earth stations or face the risk of interruption in services or suffer degradation of signal quality would unfairly prejudice the interests of the public served by existing earth stations.

As shown above, the rechannelization proposals would create new regulatory burdens by complicating coordination between terrestrial and satellite users. Unless existing earth stations were given protection from degradation caused by microwave services operating on the new frequencies, the Commission's workload of authorizing new microwave services in the 4 GHz band would be further increased by new applications from existing earth stations that had previously undergone the burdens of frequency coordination. Because C-band downlink services would be the first to be affected by the implementation of a new frequency plan, disputes involving recoordination would be inevitable in the many locales where rechannelization would make coexistence virtually impossible and would entangle the limited resources of the Commission in protracted efforts to resolve these disputes.

B. Even Assuming Protection Against Degradation for Existing Earth Stations, Proposed Rechannelization Would Have Adverse Effects Upon Other Important Segments of the C-Band Market

1. The Proposed Rechannelization of the 3.7-4.2 Band Will Hamper Growth of New Earth Stations

Even if the Commission exempts existing earth stations from

having to re-coordinate their operations, that action will not mitigate the adverse impact of the rechannelization plan proposed in the Further Notice. Such a proposal would remain contrary to the public interest in large measure because it would adversely affect continuing expansion of the C-band antenna base. GE Americom estimates that demand by cable television companies for additional antennas will continue to grow. Such demand is reflected in the weekly public notices of applications for new earth-station facilities. Growth of the C-band antenna base serves the important public interest of providing greater choice and diversity in satellite-delivered programming to the television viewing public. As more C-band satellites are launched, the ability to provide greater choice and diversity through growth is closely correlated with the ability of new earth station antennas to deliver the quality of reception enjoyed by existing earth stations. Yet, as GE Americom has shown, use of the 4 GHz band by increased numbers of microwave users operating on the new frequencies would make the siting of new earth stations exceedingly difficult and protracted, if not absolutely impossible.

2. The Impact Upon Backyard Dish Antenna Users Will Be Particularly Harsh

Likewise, protection of existing licensed earth stations will not safeguard the interests of unlicensed earth stations from the interference that could be inflicted by the microwave services operating on the new frequencies authorized by the

proposed channelization plan. There are several million C-band backyard antennas in use today that have not needed to be licensed pursuant to the Commission's deregulatory policies. Reducing the spacing between satellite frequencies and those of microwave transmitters from a ± 10 MHz to ± 5 MHz separation may render many of these backyard antennas unusable, thereby destroying the substantial consumer investment in them and throttling the delivery of high quality video programming to millions of homes, most of which are not passed by cable. At the very least, it would substantially curtail growth in the use of backyard C-band antennas.

While it is true that backyard dish owners wishing to avail themselves of the protections against interference available under the Commission's Part 21 processes could apply to register their C-band backyard antennas, such a move would have severe practical as well as policy drawbacks. It would undermine the Commission's well-founded policy against imposing on home users registration and frequency coordination obstacles that require a high degree of sophistication and expense. Moreover, there are some backyard dishes in the market that predate the Commission's two-degree spacing requirements, preventing such antennas from being included in the Commission's registration program, even though they may be satisfactory to their owners. Finally, a rush by backyard dish owners to register qualifying antennas in order to defend their right to interference-free reception and the need to resolve ensuing disputes would inundate the limited resources

of the Commission.

III.

THE COMMISSION SHOULD NOT IMPLEMENT RECHANNELIZATION WITHOUT DETERMINING THE IMPACT ON DIGITAL AND COMPRESSED VIDEO SIGNALS

Adoption of any rechannelization proposal for the 4 GHz band is also premature. As the satellite programming industry moves to digital video, with the potential for compressed channels and ultimately for Advanced Television, existing technology may not be sufficient to protect satellite signals from terrestrial interference even at a ± 10 MHz frequency offset. This reality casts even further doubt on the wisdom of adopting a channelization plan that reduces the frequency offsets to half of this amount or less. In a related proceeding in this docket, the Commission is considering how to manage the transition of 2 GHz fixed operations to higher frequency bands.[7] One proposal under consideration in that proceeding is whether to require new users of the 2 GHz band to compensate point-to-point microwave licensees for the costs of displacement.[8] Because of the imminent advent of digital video and video compression, and the mandated transition to Advanced Television, the Commission should defer any proposal to rechannel the 4 GHz band until it can assess the costs of the technology necessary to protect digital and compressed satellite services from interference and to

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[7] First Report and Order and Third Notice of Proposed Rulemaking, Docket 92-9, Order FCC 92-437 (released Oct. 16, 1992).

[8] Ibid. at ¶¶ 23-25.

determine whether these costs should be included in the compensation paid by new technology users to microwave operations that move into the 4 GHz band.

Conclusion

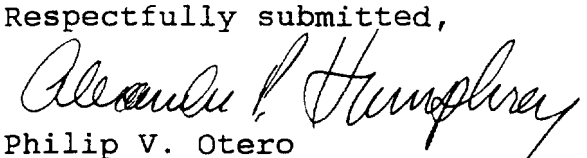
The rechannelization of the 4 GHz band proposed in the Further Notice would be extremely disadvantageous to customers of C-band satellites and the millions of end-users who rely upon these satellites to deliver high-quality video and other programming. These users and customers have invested substantial sums of money in authorized antennas and long-term service contracts and taken all practical steps to properly protect their antennas against interference, all of which efforts and investments have been undertaken in the legitimate expectation that C-band satellites would continue to provide high-quality video images and other services. GE Americom is not unsympathetic to the fact that fixed terrestrial operations might be required to migrate from the 2 GHz band. However, adoption of the proposed rechannelization plan to accommodate additional terrestrial services will, even if the Commission abides by the present rules to protect existing licensed earth stations,

(1) significantly slow and perhaps halt the installation of new C-band antennas by both commercial interests and consumers;

(2) substantially impair the introduction of new video services;

and (3) inflict harmful interference on existing and future backyard dishes. Accordingly, the Commission should not adopt these proposals.

Respectfully submitted,



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